CLAIMS

1. A plate, for use in a fuel cell assembly, for (a) conducting current and/or (b) distributing fluid, the plate comprising a substrate with a coating of an electrocatalytically-active material comprising ruthenium oxide.

2. A plate as claimed in Claim 1 in which the electrocatalytically-active material further comprises, in addition to ruthenium oxide, at least one other metal oxide.

3. A plate as claimed in Claim 1 in which the electrocatalytically-active material further comprises, in addition to ruthenium oxide, at least one metal or metal oxide from Group 8 of the Periodic Table of Elements.

4. A plate as claimed in Claim 1 in which the electroactively-active material further comprises, in addition to ruthenium oxide, at least one of PtO, Sb_2O_3, Ta_2O_5, PdO, CeO_2, Co_3O_4, TiO_2, SnO_2 and IrO_2.

5. A plate as claimed in Claim 1 in which the electroactively-active material further comprises, in addition to ruthenium oxide, TiO_2.

6. A plate as claimed in Claim 1 in which the electroactively-active material further comprises, in addition to ruthenium oxide, SnO_2.

7. A plate as claimed in Claim 1 in which the electroactively-active material further comprises, in addition to ruthenium oxide, IrO_2.

8. A plate forming part of a PEM, phosphoric acid or direct methanol fuel cell assembly, for (a) conducting current and/or (b) distributing fluid, the plate comprising a substrate with a coating of an electrocatalytically-active material comprising a mixture of ruthenium or its oxide and a metal or oxide of a metal selected from the group comprising Sn, Fe, Co, Ni or Os, preferably Sn.

9. A plate as claimed in Claim 1, the plate being in the form of a bipolar or separator plate for disposition between adjacent fuel cell units.

10. A plate as claimed in Claim 1, the plate being in the form of an end plate and/or a current-collecting plate.

11. A plate as claimed in Claim 1, the plate having a fluid inlet aperture and a fluid outlet aperture and being provided with surface features forming channels for conducting fluid flow from the inlet aperture to the outlet aperture.

12. A plate as claimed in Claim 11 in which the inlet and outlet apertures are located at opposite sides of the plate and the surface features are located in the region of the plate extending between the inlet and outlet apertures.

13. A plate as claimed in Claim 11 in which the surface features comprise a series of corrugations or a serpentine pattern.

14. A plate as claimed in Claim 1, the surface features being embossed, etched, engraved, moulded, stamped or die cast.

15. A plate as claimed in Claim 1 in which the substrate is metallic.

16. A plate as claimed in Claim 15 in which the substrate of the plate is a metal selected from Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zr, Nb, Ag, Pt, Ta, Pb, Al or alloys thereof.

17. A plate as claimed in Claim 15, the substrate of the plate being of aluminium or an alloy thereof.

18. A plate as claimed in Claim 15, the substrate of the plate being of titanium or an alloy thereof.

19. A plate as claimed in Claim 15, the substrate of the plate being of iron or an alloy thereof.

20. A plate as claimed in Claim 1, the plate being a terminal plate.

21. A plate as claimed in Claim 1 in which the plate has a further fluid inlet aperture and a further fluid outlet aperture and is provided on its opposite face with surface features forming channels for conducting fluid flow from the further inlet aperture to the further outlet aperture.

22. A plate as claimed in Claim 1 in which the plate is of monolithic structure.

23. A plate as claimed in Claim1 in which the plate is of composite structure.

24. A plate as claimed in Claim 1 in which the plate includes fittings for connection to an external electrical circuit to which energy generated by the stack is to be supplied.

25. A plate as claimed in Claim 1 including pipework for conducting fluids to and/or from the stack.

26. A plate as claimed as claimed in Claim 1 in which the internal surfaces of the pipework are at least in part coated with said coating.

27. A plate as claimed in Claim 1 in which the plate is an intermediate separator plate operable in use to conduct current from the anode of one fuel cell unit to the cathode of the adjacent fuel cell unit and/or distribute fluid flow in the fuel cell stack.

28. A plate as claimed in Claim 1 in which the inlet and outlet apertures are located at opposite sides of the plate.

29. A plate as claimed in Claim 28 including surface features located in the region of the plate extending between the inlet and outlet apertures.

30. A plate, for use in a fuel cell assembly, for (a) conducting current and/or (b) distributing fluid, the plate comprising a substrate with a coating of an electrocatalytically-active material comprising a nickel/cobalt spinel.

31. A fuel cell incorporating at least one plate as claimed in Claim 1.

32. A fuel cell as claimed in Claim 31, being a PEM, phosphoric acid or direct methanol fuel cell.

33. A fuel cell assembly or stack comprising:
a) a plurality of cell units; and
b) at least one plate as claimed in Claim 1.

34. A fuel cell assembly or stack as claimed in Claim 33 in which only the end and/or current-collecting plates of the assembly are provided with said coating.

35. A fuel cell assembly or stack as claimed in Claim 33 in which the end and/or current-carrying plates and only some of the separator plates are provided with said coating.

36. A fuel cell stack comprising a plurality of individual fuel cell units each comprising an anode, a cathode and ion exchange membrane disposed between the anode and the cathode, a plurality of bipolar or separator plates located between the anode of one unit and the cathode of an adjacent unit, and end and/or current-collecting plates associated with the stack, characterised in that at least one of the end and/or current-collecting plates and/or at least one of the bipolar or separator plates is as defined in Claim 1.

37. A fuel cell stack comprising:

a) a plurality of fuel cell units each of which contains a proton-exchange membrane separating the cell into anolyte and catholyte chambers and provided with an anode and a cathode on opposite sides thereof;

b) a separator or bipolar plate disposed between adjacent cell units;

c) end and/or current-collecting plates associated with the stack;

d) means for feeding hydrogen fuel to the anolyte chambers of the stack; and

e) means for feeding an oxygen-containing gas to the catholyte chambers of the stack;

characterised in that at least one end and/or current-collecting plate and/or at least one separator plate is as defined in Claim 1.

38. A fuel cell stack as claimed in Claim 36, being a phosphoric acid fuel cell.

39. A fuel cell stack as claimed in Claim 36, being a direct methanol fuel cell.

40. A fuel cell stack as claimed in Claim 36 including means for cooling the interior of the stack

41. A fuel cell stack as claimed in Claim 36 in which the end and/or current-collecting plates are provided with projections for engagement with a support surface to support the remainder of the stack in spaced relation with the surface.

42. A fuel cell stack as claimed Claim 36 in which the end and/or current-collecting plates comprise the primary means for the application of compression to the stack.

43. A fuel cell stack as claimed in Claim 36 in which compression is applied to the end and/or current-collecting plates and to the remainder of the stack by means of compression-applying plates located outboard of the end plates.

44. A fuel cell as claimed in Claim 36 in which the end and/or current-collecting plates are thicker than the separator plates.

45. A fuel cell stack as claimed in Claim 36 including humidifying means for introducing water vapour into the fuel and oxidant streams supplied to the stack.